I CLAIM:

1. An anomalous heat producing apparatus comprising:

a reaction vessel;

a reactant material either in liquid form, dissolved in a liquid or mixed with a liquid, the reactant material selected from the group consisting of hydrogen (H_2), hydrogen oxide (H_2O), deuterium (D_2), deuterium oxide (D_2O), hydrogen deuterium oxide (HDO), or mixtures thereof; linear alkanes, metallic hydrides, paraffins and silicones wherein at least one of the hydrogen atoms is isotopic hydrogen, said reactant material contained in said reaction vessel;

an energy source to excite said reactant material;

a catalytic material, metal or alloy substrate, a substantial part of which is selected from the group consisting of copper (Cu), nickel (Ni), titanium (Ti), palladium (Pd), or silver (Ag), said catalytic material, metal or alloy also contained in said reaction vessel and for providing a matrix configuration to position atoms of the reactant material in a manner to optimize controlled combination;

and means for conducting away heat from said reaction vessel.

2. The apparatus of claim 1 wherein the energy source is selected from sonic, mechanical, electrical, optical, magnetic or a combination thereof.

3. The apparatus of claim 2 wherein the energy source is focused sonic waves.

4. The apparatus of claim 3 wherein the metal or metal alloy comprises palladium.

5. The apparatus of claim 4 wherein the reactant material is selected from deuterium oxide, deuterium or mixtures thereof.

6. The apparatus of claim 1 wherein the apparatus further includes metal or metal alloy shielding to collect produced alpha-particles.

7. The apparatus of claim 1 wherein the apparatus further includes means to collect any helium gas produced.

8. The apparatus of claim 1 wherein the energy source is a sonic wave generator.

9. The apparatus of claim 1 wherein the reactant material comprises deuterium and the catalytic materials, metal or alloy substrate comprises palladium present in at least 99 percent by weight.

10. The apparatus of claim 1 wherein the palladium is present as a finely divided powder, a fine mesh screen, a thin band of palladium from 1 to 10 microns in thickness, a palladium foil to 40 microns in thickness, or a palladium tipped thermo-electric device.

11. The apparatus of claim 1 wherein the reactant material is in a liquid form and further wherein the energy source is focused sonic waves of sufficient energy to cause cavitation bubbles to form in the liquid reactant material.

12. The apparatus of claim 11 wherein the reactant material comprises deuterium and

the catalytic materials, metal or alloy substrate comprises palladium present in at least 99 percent by weight.

13. The apparatus of claim 12 wherein the metal or metal alloy comprises palladium.

14. The apparatus of claim 13 wherein the reactant material is selected from deuterium oxide, deuterium or mixtures thereof.

15. The apparatus of claim 11 wherein the catalytic material is palladium present as a divided powder where the particle size exceeds the cavitation bubble size.

16. The apparatus of claim 1 wherein the means for conducting heat away from said reaction vessel includes a circulation system and a heat exchanger positioned exterior of said reaction vessel, said circulation system for circulating the reactant material between said reaction vessel and said heat exchanger.

17. The apparatus of claim 1 further including means to separate any helium or helium isotopes formed in said reaction vessel from combination of the reactant material within said reaction vessel.

18. The apparatus of claim 1 wherein the means for conducting heat away from said reaction vessel includes bimetallic thermo-electric means for converting heat of combination within said reaction vessel into electrical energy.

19. The apparatus of claim 17 wherein the reactant material is in a liquid form and further wherein the energy source is focused sonic waves of sufficient energy to cause cavitation bubbles to form in the liquid reactant material.

20. The apparatus of claim 18 wherein the reactant material comprises deuterium and the catalytic materials, metal or alloy substrate comprises palladium present in at least 99 percent by weight.

21. The apparatus of claim 19 wherein the metal or metal alloy comprises palladium.

22. The apparatus of claim 21 wherein the reactant material is selected from deuterium oxide, deuterium or mixtures thereof.

23. A method of obtaining controlled combination of isotopic hydrogen, which method comprises:

(a) forming a metal or metal alloy matrix comprising palladium into a matrix structure;

(b) contacting the metal matrix with one or more reactant compounds which comprise isotopic hydrogen, such that the isotopic hydrogen atoms are within the range where nuclear repulsion ordinarily occurs for said isotopic hydrogen atoms;

(c) subjecting the matrix and reactant charge to nuclear repulsion compounds with energy sufficient to excite the reactant compounds; and

(d) producing controlled combination thereby producing excess heat, gamma rays, and helium or a helium isotope.

24. The method of claim 23 wherein the metal or metal alloy comprises palladium in 99.9 percent by weight or greater, the reactant compound comprises deuterium, and the energy source is acoustic and utilizes cavitation micro-bubble technology to produce the focused energy to obtain controlled combination.

25. An apparatus for producing heat, said apparatus comprising:

a reaction vessel comprising an inlet and an outlet and opposed walls;

a bubble collapsing metal surface in between said opposed walls, said metal surface capable of absorbing a hydrogen isotope;

means for producing transient asymmetric high energy bubbles directed against said metal surface in a liquid medium, when said liquid medium is present in said reaction vessel;

means for heat transfer from heat produced in said reaction vessel to a heat receiving means.

26. A apparatus according to claim 25, wherein said bubbles producing means is a sonicator capable of producing sound waves at at least about 10 KHz to provide energy at said metal surface of at least about 1 W/cm^2.

27. A apparatus according to claim 26, wherein said sonicator comprises a liquid reservoir at an elevated pressure, said reservoir sharing a thin wall with said reaction vessel, said thin wall opposite said metal surface.

28. A apparatus according to claim 25, wherein said wherein said metal surface is a metal of Groups IV to VIII of the Periodic Chart.

29. A apparatus according to claim 25, wherein said heat transfer means comprises a circulation system and a heat exchanger positioned exterior to said reaction vessel.

30. A apparatus according to claim 25, wherein said heat transfer means comprises a bimetallic thermo-electric means for converting heat into electrical energy.